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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,211	09/19/2003	Miyoko Kawashima	1232-5161	8297
27123	7590	01/12/2005		
MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			EXAMINER FULLER, RODNEY EVAN	
			ART UNIT	PAPER NUMBER
			2851	

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

10/666,211

Applicant(s)

KAWASHIMA ET AL.

Examiner

Rodney E Fuller

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-- Th MAILING DATE of this communication appears on th cover sheet with the corresp ndence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

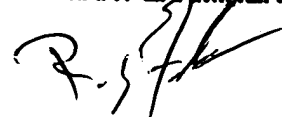
- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Pri rity under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

RODNEY FULLER
PRIMARY EXAMINER


Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>09/27/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. Figure 19 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 1-5, 13-17 are related to a method / system that utilizes a light source with two sections with different polarization. Claims 6-11 are related to a method with a step splitting light into two different polarization states. Claim 12 is related to a method with a step of controlling the polarization direction of the light source. The specification states:

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- a. (page 16, lines 14-16): *"...it is most effective to control the polarization between an optical system 171 and an optical integrator 172..."*
- b. (page 17, lines 20-21): *"As a result of an insertion of a filter prior to the optical integrator 172..."*
- c. (page 35, lines 22-25): *"...the effective light source shape 10B shown in Figure 1 is implemented as an aperture stop 10B that has the light transmission parts 12B and 14B, and light shielding part 18B."*
- d. (page 36, lines 7-11): *"An illumination optical system and exposure apparatus having the above aperture stop, or an exposure apparatus having an exposure mode that may execute an exposure method that controls polarization as discussed."*

Thus, the disclosure seems to suggest that polarization state is controlled by placing a filter between the optical system 171 and the optical integrator (shown in Figure 16). Along with the filter, an annular aperture stop is used at ref.#174 of Figure 16 to create the shape of the light source as shown in Figure 1. There is no discussion or suggestion of how a polarization filter and an annular aperture would (1) create an effective light source as shown in Figure 1A, 1B, etc. that would have two sections with different polarization, (2) split light into two different polarization states, or (3) control the polarization direction of the light source.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 1-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are related to (claim 1) "...an illumination system that forms an effective light source having a first part that includes only s-polarized light..." (claims 2 and 14) "...wherein the first part has an annular shape in which the s-polarized light polarizes in a tangential direction of the annular shape;" (claim 16) "...a second part that mixes the s-polarized light and p-polarized light;" and a system / method that splits (claim 9) "... the light into s-polarized light and p-polarized light."

The applicant defines s- and p-polarized light on page 13 referring to Figures 12A and 12B. On page 20, lines 11-19 of the specification and claims 1-2, the applicant states "s-polarized light polarizes in a tangential direction of the annular shape." (See Figure 1A as example).

The claims, specification, and drawings are unclear since the applicant states (claims, specification) that the light is s-polarized in a tangential direction of the annular shape. However, the polarization state would be p-polarized at the top and bottom, s-polarized at the left and right of the light source shown in Figure 1A as an example. Thus, the light cannot be "s-polarized in a tangential direction of the annular shape." It appears from the drawings, that the applicant may intend to describe and claim that the light is linearly polarized around the annular shape, wherein the phase of the polarized light changes around the annular shape. Alternatively, the applicant may intend to describe and claim that the light is s-polarized around the annular shape and not tangential to the annular shape, which is contrary to any of the figures. Further, it

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is unclear how any structure described in the specification or shown in the drawings can split the light into s- and p-polarized light or mix the s- and p- polarized light.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Shiraishi (US 6,404,482).

As best the examiner can ascertain the claimed invention, Shiraishi discloses all the structure set forth in the claims.

Regarding independent claims 1, 6, 8, 9, 12-17, Shiraishi discloses a projection optical system for illuminating a pattern (Fig. 4, ref. # R) with an illumination system that utilizes a first and second regions with two different polarization states (see Figure 7, FB1, FB2).

The dependent claims are likewise met by Shiraishi.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Keum (US 5,245,470), Inoue, et al. (US 5,673,103), Mizouchi (US 6,259,512), Fujishima, et al. (US 6,788,389), Omura, et al. (US 6,831,731) and Shiraishi (US 6,310,679)

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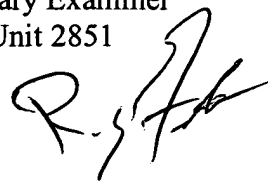
each disclose an exposure system and/or method for illuminating a mask with an illumination source with a first and second regions with different polarization states.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney E Fuller whose telephone number is 571-272-2118. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rodney E Fuller
Primary Examiner
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A handwritten signature in black ink, appearing to read 'R. E. Fuller', is written over the printed name and title of the examiner.

January 5, 2005